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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/941,048 | 08/28/2001 | Takeshi Nishi | SEL 274 | 5731 |

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EXAMINER

YAMNITZKY, MARIE ROSE

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1774

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/941,048

Applicant(s)

NISHI ET AL.

Examiner

Marie R. Yamnitzky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on November 15, 2004 and January 18, 2005 have been entered.

2. Applicant's amendment received November 15, 2004 amends claims 1, 3, 5, 7, 9 and 11, and overcomes the rejection of claims 1-12 under 35 U.S.C. 112, 1st paragraph.

Applicant's amendment received January 18, 2005 amends claims 1, 3, 5, 7, 9 and 11.

Claims 1-12 are pending.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-4 stand rejected under 35 U.S.C. 103(a) as being unpatentable over O'Brien et al. in *Appl. Phys. Lett.* Vol. 74, No. 3, pp. 442-444 or Baldo et al. in *Appl. Phys. Lett.* Vo. 75, No. 1, pp. 4-6, either reference in view of Salbeck et al. in *Synthetic Metals* 91, pp. 209-215, for reasons of record in the Office action mailed December 23, 2003.

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4. Claims 5-12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Grushin et al. (US 2002/0121638 A1) in view of Salbeck et al. in *Synthetic Metals* 91, pp. 209-215, for reasons of record in the Office action mailed December 23, 2003.

5. Applicant's arguments filed November 15, 2004 and January 18, 2005 have been fully considered but they are not persuasive.

The examiner recognizes that the claimed light emitting device must comprise both a spiro compound and an organic luminescent layer capable of converting triplet excitation energy into light to be emitted. In the case of claims 1, 2 and 5-8, the spiro compound is spiro-CBP and is present as a host material in the organic luminescent layer. In the case of claims 3 and 4, the spiro compound is spiro-NPD and is present in a hole transport layer that is adjacent to the organic luminescent layer. In the case of claims 9 and 10, the spiro compound is spiro-TAZ and is present in a hole blocking layer that is adjacent to the organic luminescent layer. In the case of claims 11 and 12, the spiro compound is spiro-PBD and is present in a hole blocking layer that is adjacent to the organic luminescent layer.

Each of the primary references discloses a light emitting device that comprises an organic luminescent layer capable of converting triplet excitation energy into light to be emitted. None of the primary references discloses the spiro compounds required by the present claims.

Each of the primary references discloses CBP (not spiro) as a host material for the luminescent layer capable of converting triplet excitation energy into light to be emitted.

The primary references of O'Brien et al. and Baldo et al. disclose NPD (not spiro) as a suitable material for a hole transport layer that is adjacent to the organic luminescent layer.

The primary reference of Grushin et al. discloses TAZ (not spiro) and PBD (not spiro) as suitable materials for an electron transporting layer that is adjacent to the organic luminescent layer. An electron transporting layer made of either of these two materials inherently functions as a hole blocking layer.

The secondary reference of Salbeck et al. teaches the advantages of compounds having a spiro-linkage. While Salbeck et al. do not explicitly teach using the compounds in a light emitting device having an organic luminescent layer capable of converting triplet excitation energy into light to be emitted, Salbeck et al. do suggest using the compounds in a light emitting device having an organic luminescent layer.

Based on Salbeck's teaching that compounds having a spiro-linkage retain the electronic properties of the related compounds having no spiro-linkage, one of ordinary skill in the art would have reasonably expected spiro-CBP to have similar electronic properties as CBP and therefore to be usable for the same purposes as CBP in a light emitting device. Likewise, one of ordinary skill in the art would have reasonably expected spiro-NPD to have similar electronic properties as NPD, spiro-TAZ to have similar electronic properties as TAZ, and spiro-PBD to have similar electronic properties as PBD, and would have expected the spiro compounds to be usable in a light emitting device for the same purposes as the related compounds having no spiro-linkage.

Based on Salbeck's teachings that compounds having a spiro-linkage have improved processability and morphologic stability compared to the related compounds having no spiro-linkage, one of ordinary skill in the art would have reasonably expected that spiro-CBP, spiro-NPD, spiro-TAZ and spiro-PBD would provide advantages over CBP, NPD, TAZ and PBD respectively, in light emitting devices having an organic luminescent layer. Further one of ordinary skill in the art at the time of the invention would have reasonably expected the spiro compounds to provide advantages over the related compounds having no spiro-linkage regardless of the mode of light emission (i.e. regardless of whether light is emitted from the organic luminescent layer via a singlet excited state, typically referred to as fluorescence, or via a triplet excited state, typically referred to as phosphorescence).

Applicant argues that applicant has discovered that high durability associated with increase of glass transition temperature and high molecular stability are possible by using a spiro compound. This is not unexpected given the teachings of Salbeck et al.

With respect to applicant's argument regarding larger excitation energy for emitting phosphorescence, it is not clear if applicant is referring to the larger excitation energy of a phosphorescent (triplet) emitter versus a fluorescent (singlet) emitter (which is inherently achieved by the use of a phosphorescent emitter in each of the primary references), or if applicant is implying that the use of a spiro compound increases the excitation energy for phosphorescent emission as compared to a device exhibiting phosphorescent emission but containing the related non-spiro compound. The examiner notes that no data are of record

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demonstrating that the spiro compounds increase the excitation energy for phosphorescent emission compared to the related non-spiro compounds.

6. Miscellaneous:

In line 8 of claim 3, "expressed" should read --expressed--. This spelling error was introduced by applicant's amendment received January 18, 2005.

The first full paragraph on page 10 of applicant's amendment received January 18, 2005 refers to phosphorescence from a singlet luminescent material. Emission from a singlet luminescent material is not typically referred to as phosphorescence.

7. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for Art Unit 1774 is (703) 872-9306 for all official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
April 01, 2005



MARIE YAMNITZKY
PRIMARY EXAMINER

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